

**MATHEMATICS CROSSWALK**  
**2008 DRAFT MATHEMATICS STANDARD TO 2003 MATHEMATICS STANDARD**  
**HIGH SCHOOL**

<b>MATHEMATICS STANDARD ARTICULATED BY GRADE LEVEL</b>				
<b>Strand 1: Number and Operations</b>				
<b>CONCEPT</b>	<b>2008 PO</b>	<b>ITEM DESCRIPTION</b>	<b>2003 PO</b>	<b>ITEM DESCRIPTION</b>
<b>1. Number Sense</b>	1	Explain that to solve certain problems and equations, number systems need to be extended from whole numbers to integers, from integers to rational numbers, from rational numbers to real numbers.	1	Classify real numbers as members of one or more subsets: natural, whole, integers, rational, or irrational numbers.
	2	Explain when sets of numbers are finite or infinite.	3	Distinguish between finite and infinite sets of numbers.
	3	Express that a number's distance from zero on the number line is its absolute value and the distance between two numbers is the absolute value of their difference. *		
	M08-S1C2-03	<b>Moved to Grade 8</b>	2	Identify properties of the real number system: commutative, associative, distributive, identity, inverse, and closure.
<b>2. Numerical Operations</b>	1	Solve word problems including those that require absolute value, powers, roots, and scientific notation.	2	Solve word problems using grade-level appropriate operations and numbers.
			1	Select the grade-level appropriate operation to solve word problems.
	2	Summarize properties of and connections between real number operations.	S1C1-02	Identify properties of the real number system: commutative, associative, distributive, identity, inverse, and closure.
	3	Simplify numerical expressions including those with absolute value using the order of operations and properties of real number operations	3	Simplify numerical expressions including signed numbers and absolute values.
			7	Simplify numerical expressions using the order of operations.
	4	Compute using scientific notation.	6	Compute using scientific notation.

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<b>2. Numerical Operations</b>	5	Calculate powers and roots of real numbers, both rational and irrational, with or without technology.	S3C3-14	Calculate powers and roots of real numbers, both rational and irrational, using technology when appropriate.
		<b>REMOVED (this skill is required throughout the standard)</b>	5	Use grade level-appropriate mathematical terminology.
	MHS-S3C3-02	<b>Moved to Strand 3 Concept 3</b>	4	Apply subscripts to represent ordinal position.
<b>3. Estimation</b>	1	Use estimation to determine the reasonableness of a solution.	2	Determine if a solution to a problem is reasonable.
	2	Determine rational approximations of irrational numbers.	3	Determine rational approximations of irrational numbers.
	3	Locate the position of a rational or irrational number on a number line. *		
	4	Determine when an estimate is more appropriate than an exact answer. *		
	M08-S1C3-01	<b>Moved to Grade 8</b>	1	Solve grade-level appropriate problems using estimation.

<b>Strand 2: Data Analysis, Probability, and Discrete Mathematics</b>				
<b>CONCEPT</b>	<b>2008 PO</b>	<b>ITEM DESCRIPTION</b>	<b>2003 PO</b>	<b>ITEM DESCRIPTION</b>
<b>1. Data Analysis (Statistics)</b>	1	Display data, including paired data, as lists, tables, matrices, and plots with or without technology; make predictions and observations about patterns or departures from patterns.	3	Display data as lists, tables, matrices, and plots.
			4	Construct equivalent displays of the same data.
			7	Make reasonable predictions based upon linear patterns in data sets or scatter plots.
			8	Make reasonable predictions for a set of data, based on patterns.
			14	Determine whether displayed data has positive, negative, or no correlation.
	2	Draw inferences about data sets from lists, tables, matrices, and plots.	9	Draw inferences from charts, tables, graphs, plots, or data sets.

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<b>Strand 2: Data Analysis, Probability, and Discrete Mathematics</b>				
<b>CONCEPT</b>	<b>2008 PO</b>	<b>ITEM DESCRIPTION</b>	<b>2003 PO</b>	<b>ITEM DESCRIPTION</b>
<b>1. Data Analysis (Statistics)</b>	3	Compare data sets using the appropriate measure(s) (mean, median, mode, range, and quartiles).	10	Apply the concepts of mean, median, mode, range, and quartiles to summarize data sets.
	4	Determine which measure of center is most appropriate in a given situation and explain why.	6	Identify which of the measures of central tendency is most appropriate in a given situation.
	5	Organize collected data into an appropriate graphical representation with or without technology.	2	Organize collected data into an appropriate graphical representation.
	6	Evaluate the reasonableness of conclusions drawn from data analysis.	11	Evaluate the reasonableness of conclusions drawn from data analysis.
	7	Explain misrepresentations and distortions in displays of data.	5	Identify graphic misrepresentations and distortions of sets of data.
			12	Recognize and explain the impact of interpreting data (making inferences or drawing conclusions) from a biased sample.
	8	Design simple experiments or investigations and collect data to answer questions.	1	Formulate questions to collect data in contextual situations.
		<b>REMOVED</b>	16	Identify differences between sampling and census.
	M08-S2C1-01	<b>Moved to Grade 8</b>	13	Draw a line of best fit for a scatter plot.
	MCWR-S2C2-04	<b>Moved to College and Work Readiness</b>	15	Identify a normal distribution.
	M08-S2C1-05	<b>Moved to Grade 8</b>	17	Identify differences between biased and unbiased samples.

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<b>Strand 2: Data Analysis, Probability, and Discrete Mathematics</b>				
<b>CONCEPT</b>	<b>2008 PO</b>	<b>ITEM DESCRIPTION</b>	<b>2003 PO</b>	<b>ITEM DESCRIPTION</b>
<b>2. Probability</b>	1	Model situations involving probability with simulations for independent and dependent events. *		
	2	Estimate probabilities using experiments and compare the results with theoretical probabilities.	4	Record the data from performing a grade-level appropriate probability experiment.
			5	Compare the outcome of an experiment to predictions made prior to performing the experiment.
			7	Compare the results of two repetitions of the same grade-level appropriate probability experiment.
	3	Make predictions and solve problems based on theoretical probability models.	3	Predict the outcome of a grade-level appropriate probability experiment.
	4	Explain and use the law of large numbers (that experimental results tend to approach theoretical probabilities after a large number of trials). *		
	5	Explain the concept of and calculate expected value for probability. *		
	6	Use concepts and formulas of area to calculate geometric probabilities.	2	Determine simple probabilities related to geometric figures.
	M07-S2C2-01	<b>Moved to Grade 7</b>	1	Find the probability that a specific event will occur, with or without replacement.
	M07-S2C2-02	<b>Moved to Grade 7</b>	6	Distinguish between independent and dependent events.

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<b>Strand 2: Data Analysis, Probability, and Discrete Mathematics</b>				
<b>CONCEPT</b>	<b>2008 PO</b>	<b>ITEM DESCRIPTION</b>	<b>2003 PO</b>	<b>ITEM DESCRIPTION</b>
<b>3. Discrete Mathematics – Systematic Listing and Counting</b>	1	Apply the addition and multiplication principles of counting, representing these principles algebraically including factorial notation. *		
	2	Apply appropriate means of computing the number of possible arrangements of the items in each case to solve problems by distinguishing between situations where order matters (permutations) and situations where it does not (combinations).	3	Use combinations or permutations to solve contextual problems.
	3	Determine the number of possible outcomes of an event.	2	Determine when to use combinations versus permutations in counting objects.
			1	Determine the number of possible outcomes for a contextual event using a chart, a tree diagram, or the counting principle.
<b>4. Discrete Mathematics – Vertex-Edge Graphs</b>		<b>Grades Kindergarten-8, College and Work Readiness</b>		

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<b>Strand 3: Patterns, Algebra, and Functions</b>				
<b>CONCEPT</b>	<b>2008 PO</b>	<b>ITEM DESCRIPTION</b>	<b>2003 PO</b>	<b>ITEM DESCRIPTION</b>
<b>1. Patterns</b>	1	Use explicit and recursive formulas involving both subscripts and function notation to generate patterns.	1	Communicate a grade-level appropriate iterative or recursive pattern, using symbols or numbers.
	2	Describe and model patterns.	3	Evaluate problems using basic recursion formulas.
	3	Determine a specific term of a pattern.	2	Find the $n^{\text{th}}$ term of an iterative or recursive pattern.
<b>2. Functions and Relationships</b>	1	Use function notation; evaluate a function at a specified value in its domain. *		
	2	Sketch and interpret a graph that models a given context, make connections between the graph and the context, and solve maximum and minimum problems using the graph.	2	Describe a contextual situation that is depicted by a given graph.
			3	Identify a graph that models a given real-world situation.
			4	Sketch a graph that models a given contextual situation.
			6	Determine the solution to a contextual maximum/minimum problem, given the graphical representation.
	3	Use multiple representations (equations, graphs, tables, descriptions, sets of ordered pairs) to express the relationship between two variables.	S3C3-05	Translate a sentence written in context into an algebraic equation involving multiple operations.
			S3C3-06	Write a linear equation for a table of values.
			7	Express the relationship between two variables using tables/matrices, equations, or graphs.
			8	Interpret the relationship between data suggested by tables/matrices, equations, or graphs.

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<b>CONCEPT</b>	<b>2008 PO</b>	<b>ITEM DESCRIPTION</b>	<b>2003 PO</b>	<b>ITEM DESCRIPTION</b>
<b>2. Functions and Relationships</b>	4	Determine if a relationship is a function, given an equation, graph, table, description, or set of ordered pairs.	1	Determine if a relationship is a function, given a graph, table, or set of ordered pairs.
	5	Recognize and solve problems that can be modeled using a linear function in one variable.	S3C3-11	Solve an algebraic proportion.
			S3C3-07	Write a linear algebraic sentence that represents a data set that models a contextual situation.
	6	Recognize and solve problems that can be modeled using a system of two equations in two variables. *		
	7	Recognize and solve problems that can be modeled using a quadratic function. *		
	8	Determine domain and range for a function from an equation, graph, table, description, or set of ordered pairs.	5	Determine domain and range for a function.
	MHS-S3C3-08	<b>Moved to Strand 3 Concept 3</b>	9	Determine from two linear equations whether the lines are parallel, perpendicular, coincident, or intersecting but not perpendicular.
<b>3. Algebraic Representations</b>	1	Understand and explain the need for equivalent forms of the same expression or linear equation.	4	Translate a written expression or sentence into a mathematical expression or sentence.

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<b>Strand 3: Patterns, Algebra, and Functions</b>				
<b>CONCEPT</b>	<b>2008 PO</b>	<b>ITEM DESCRIPTION</b>	<b>2003PO</b>	<b>ITEM DESCRIPTION</b>
<b>3. Algebraic Representations</b>	2	Solve formulas for specified variables.	S3C4-02	Solve formulas for specified variables.
			S1C2-04	Apply subscripts to represent ordinal position.
	3	Write an equation of a line given: two points on the line, the slope and a point on the line, or the graph of the line.	10	Write an equation of the line given: two points on the line, the slope and a point on the line, or the graph of the line.
	4	Simplify and evaluate polynomials, rational expressions, expressions containing absolute value, and radicals.	1	Evaluate algebraic expressions, including absolute value and square roots.
	5	Solve linear equations in one variable and equations involving the absolute value of a linear function.	15	Simplify square roots and cube roots with monomial radicands (including those with variables) that are perfect squares or perfect cubes.
			8	Solve linear (first degree) equations in one variable (may include absolute value).
	6	Solve linear inequalities in one variable.	9	Solve linear inequalities in one variable.
	7	Solve systems of two linear equations in two variables.	12	Solve systems of linear equations in two variables (integral coefficients and rational solutions).
	8	Determine from two linear equations whether the lines are parallel, perpendicular, coincident, or intersecting but not perpendicular.	S3C2-09	Determine from two linear equations whether the lines are parallel, perpendicular, coincident, or intersecting but not perpendicular.
	9	Solve square root radical equations involving only one radical	16	Solve square root radical equations involving only one radical.
	10	Solve quadratic equations.	17	Solve quadratic equations.
	11	Add, subtract, and multiply polynomial and rational expressions.	2	Simplify algebraic expressions.
	12	Multiply and divide monomial expressions with integer exponents.	3	Multiply and divide monomial expressions with integral exponents.

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<b>Strand 3: Patterns, Algebra, and Functions</b>				
<b>CONCEPT</b>	<b>2008 PO</b>	<b>ITEM DESCRIPTION</b>	<b>2003 PO</b>	<b>ITEM DESCRIPTION</b>
<b>3. Algebraic Representations</b>	13	Factor polynomials by removing the greatest common factor; factor quadratic polynomials in the form of $x^2 + bx + c$ where $b$ and $c$ are integers. *		
	MCWR-S3C3-07	<b>Moved to College and Work Readiness</b>	13	Add, subtract, and perform scalar multiplication with matrices.
	MHS-S3C2-03	<b>Moved to Strand 3 Concept 2</b>	5	Translate a sentence written in context into an algebraic equation involving multiple operations.
	MHS-S3C2-03	<b>Moved to Strand 3 Concept 2</b>	6	Write a linear equation for a table of values.
	MHS-S3C2-05	<b>Moved to Strand 3 Concept 2</b>	7	Write a linear algebraic sentence that represents a data set that models a contextual situation.
	MHS-S3C2-05	<b>Moved to Strand 3 Concept 2</b>	11	Solve an algebraic proportion.
	MHS-S1C2-05	<b>Moved to Strand 1 Concept 2</b>	14	Calculate powers and roots of real numbers, both rational and irrational, using technology when appropriate.
	MHS-S4C1-08	<b>Moved to Strand 4 Concept 1</b>	18	Identify the sine, cosine, and tangent ratios of the acute angles of a right triangle.
<b>4. Analysis of Change</b>	1	Determine slope and the intercepts of the graph of a linear function, interpreting slope as a constant rate of change.	1	Determine slope, x-, and y-intercepts of a linear equation.
	2	Solve problems involving rate of change. *		
	3	Solve interest problems. *		
	MHS-S3C3-02	<b>Moved to Strand 3 Concept 3</b>	2	Solve formulas for specified variables.

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<b>Strand 4: Geometry and Measurement</b>				
<b>CONCEPT</b>	<b>2008 PO</b>	<b>ITEM DESCRIPTION</b>	<b>2003 PO</b>	<b>ITEM DESCRIPTION</b>
<b>1. Geometric Properties</b>	1	Use the basic properties of a circle (relationships between angles, radii, intercepted arcs, chords, tangents, and secants) to prove basic theorems and solve problems.	7	Solve problems by applying the relationship between circles, angles, and intercepted arcs.
			8	Solve problems by applying the relationship between radii, diameters, chords, tangents, or secants.
	2	Visualize solids and surfaces in 3-dimensional space when given 2-dimensional representations (e.g., nets, multiple views) and create 2-dimensional representations for the surfaces of 3-dimensional objects.	3	Make a net to represent a 3-dimensional object.
			4	Make a 3-dimensional model from a net.
			5	Draw 2-dimensional and 3-dimensional figures with appropriate labels.
	3	Solve problems in context using angle and side length relationships and attributes of polygons.	6	Solve problems related to complementary, supplementary, or congruent angle concepts.
			14	Solve contextual situations using angle and side length relationships.
	4	Prove that two triangles are similar by applying SAS, SSS, or AA similarity postulates.	12	Determine when triangles are similar by applying SAS, SSS, or AA similarity postulates.
	5	Prove that two triangles are congruent by applying SSS, ASA, AAS, or SAS.	11	Determine when triangles are congruent by applying SSS, ASA, AAS, or SAS.
	6	Solve problems using right triangles, including special triangles.	10	Solve problems using special case right triangles.
	7	Solve problems using the triangle inequality property.	9	Solve problems using the triangle inequality property.
	8	Solve problems using the sine, cosine, and tangent ratios of the acute angles of a right triangle.	S3C3-18	Identify the sine, cosine, and tangent ratios of the acute angles of a right triangle.

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<b>Strand 4: Geometry and Measurement</b>				
<b>CONCEPT</b>	<b>2008 PO</b>	<b>ITEM DESCRIPTION</b>	<b>2003 PO</b>	<b>ITEM DESCRIPTION</b>
<b>1. Geometric Properties</b>	9	Explore geometries other than Euclidean geometry in which the parallel postulate is not true. *		
	MHS-S4C1-06	<b>REMOVED (applying these skills in MHS-S4C1-06)</b>	1	Identify the attributes of special triangles (isosceles, equilateral, right).
	M08-S5C2-05	<b>Moved to Grade 8</b>	2	Identify the hierarchy of quadrilaterals.
	MCWR-S4C1-01	<b>Moved to College and Work Readiness and applying these skills to MHS-S4C2-03</b>	13	Construct a triangle congruent to a given triangle.
<b>2. Transformation of Shapes</b>	1	Determine the effects of a single transformation on linear or area measurements of a planar geometric figure.	6	Determine the effects of a single transformation on linear or area measurements of a planar geometric figure.
	2	Determine whether a transformation of a figure on a coordinate plane represents a translation, reflection, rotation, or dilation and whether congruence is preserved.	2	Identify the properties of the planar figure that is the result of two or more transformations.
			4	Determine whether a given pair of figures on a coordinate plane represents a translation, reflection, rotation, or dilation.
			5	Classify transformations based on whether they produce congruent or similar figures.
	3	Sketch and describe the properties of the plane figure that is the result of two or more transformations.	1	Sketch the planar figure that is the result of two or more transformations.
			2	Identify the properties of the planar figure that is the result of two or more transformations.
	4	Determine the new coordinates of a point when a single transformation is performed on a planar geometric figure.	3	Determine the new coordinates of a point when a single transformation is performed on a planar geometric figure.

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<b>Strand 4: Geometry and Measurement</b>				
<b>CONCEPT</b>	<b>2008 PO</b>	<b>ITEM DESCRIPTION</b>	<b>2003 PO</b>	<b>ITEM DESCRIPTION</b>
<b>3. Coordinate Geometry</b>	1	Graph a linear equation in two variables.	2	Graph a linear equation in two variables.
	2	Graph a linear inequality in two variables.	3	Graph a linear inequality in two variables.
	3	Determine the solution to a system of linear equations in two variables from the graphs of the equations.	4	Determine the solution to a system of equations in two variables from a given graph.
	4	Graph a quadratic function and interpret x-intercepts as zeros.	1	Graph a quadratic equation with lead coefficient equal to one.
	5	Determine changes in the graph of a linear function when constants and coefficients in its equation are varied.	6	Determine changes in the graph of a linear function when constants and coefficients in its equation are varied.
	6	Determine how to find the midpoint between two points in a coordinate system.	5	Determine the midpoint between two points in a coordinate system.
	7	Determine the distance between two points in the coordinate system.	7	Determine the distance between two points in the coordinate system.
	8	Illustrate the connection between the distance formula and the Pythagorean Theorem. *		
	9	Verify characteristics of a given geometric figure using coordinate formulas such as distance, midpoint, and slope to confirm parallelism, perpendicularity, and congruence.	S5C2-14	Verify characteristics of a given geometric figure using coordinate formulas such as distance, midpoint, and slope to confirm parallelism, perpendicularity, and congruency.

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Strand 4: Geometry and Measurement				
CONCEPT	2008 PO	ITEM DESCRIPTION	2003 PO	ITEM DESCRIPTION
<b>4. Measurement</b>	1	Use dimensional analysis to keep track of units of measure when converting. *		
	2	Calculate the area of a figure composed of two or more geometric shapes.	1	Calculate the area of geometric shapes composed of two or more geometric figures.
	3	Determine the effect that changing dimensions has on the perimeter, area, or volume of a figure.	4	Compare perimeter, area, or volume of figures when dimensions are changed.
	4	Find the length of a circular arc; find the area of a sector of a circle.	5	Find the length of a circular arc.
			6	Find the area of a sector of a circle.
	5	Solve problems involving similar figures using ratios and proportions.	9	Solve scale factor problems using ratios and proportions.
			10	Solve applied problems using similar triangles.
	6	Calculate the volume and surface area of 3-dimensional geometric figures.	2	Calculate the volumes of 3-dimensional geometric figures.
			3	Calculate the surface areas of 3-dimensional geometric figures.
	7	Solve for missing measures in a 3-dimensional figure (i.e., slant height, height).	7	Solve for missing measures in a pyramid (i.e., slant height, height).
	M07-S4C1-03	<b>Moved to Grade 7</b>	8	Find the sum of the interior and exterior angles of a polygon.

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<b>Strand 5: Structure and Logic</b>				
<b>CONCEPT</b>	<b>2008 PO</b>	<b>ITEM DESCRIPTION</b>	<b>2003 PO</b>	<b>ITEM DESCRIPTION</b>
<b>1. Algorithms and Algorithmic Thinking</b>	1	Analyze algorithms for validity and equivalence.	1	Determine whether a given procedure for simplifying an expression is valid.
			2	Determine whether a given procedure for solving an equation is valid.
			3	Determine whether a given procedure for solving a linear inequality is valid.
	2	Select an algorithm that explains a particular mathematical process; determine the purpose of a simple mathematical algorithm.	4	Select an algorithm that explains a particular mathematical process.
			5	Determine the purpose of a simple mathematical algorithm.
	MCWR-S5C1-01	<b>Moved to College and Work Readiness</b>	6	Determine whether given simple mathematical algorithms are equivalent.
<b>2. Logic, Reasoning, Arguments, and Mathematical Proof</b>	1	Create and analyze inductive and deductive arguments concerning geometric ideas and relationships.	7	Create inductive and deductive arguments concerning geometric ideas and relationships, such as congruence, similarity, and the Pythagorean relationship.
			8	Critique inductive and deductive arguments concerning geometric ideas and relationships, such as congruence, similarity, and the Pythagorean relationship.
	2	Write an appropriate conjecture given a certain set of circumstances.	3	Write an appropriate conjecture given a certain set of circumstances.
	3	Investigate conjectures by: <ul style="list-style-type: none"> <li>analyzing a conjecture using principles of logic,</li> <li>validating a conjecture using inductive reasoning, and</li> <li>disproving a conjecture using a counterexample.</li> </ul>	4	Analyze assertions related to a contextual situation by using principles of logic.
			5	Identify a valid conjecture using inductive reasoning.
			6	Distinguish valid arguments from invalid arguments.
			9	Identify a counterexample for a given conjecture.
			10	Construct a counterexample to show that a given conjecture is false.

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<b>2. Logic, Reasoning, Arguments, and Mathematical Proof</b>	4	Draw a simple valid conclusion from a given <i>if...then</i> statement and a minor premise.	1	Draw a simple valid conclusion from a given <i>if...then</i> statement and a minor premise.
	5	State the inverse, converse, and contrapositive of a given statement and state the relationship between the truth value of these statements and the original statement.	11	State the inverse, converse, or contrapositive of a given statement.
			12	Determine if the inverse, converse, or contrapositive of a given statement is true or false.
	6	List related <i>if... then</i> statements in logical order.	2	List related <i>if... then</i> statements in logical order.
	7	Construct a simple formal deductive proof.	13	Construct a simple formal or informal deductive proof.
	8	Identify and explain the roles played by definitions, postulates, propositions and theorems in the logical structure of mathematics, including Euclidean geometry. *		
	9	Apply properties, theorems, and constructions about parallel lines, perpendicular lines, and angles to prove other theorems. *		
	10	Explore Euclid's five postulates in a plane and explore their limitations when applied to non-Euclidean geometry. *		
	MHS-S4C3-09	<b>Moved to Strand 4 Concept 3</b>	14	Verify characteristics of a given geometric figure using coordinate formulas such as distance, mid-point, and slope to confirm parallelism, perpendicularity, and congruency.

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